THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:

VOLUME I: FIELD OPERATIONS (FO)
VOLUME II: GROUNDWATER (GW)
VOLUME III: GEOTECHNICAL (GT)
VOLUME IV: SURFACE WATER (SW)
VOLUME V: ECOLOGY (EE)
VOLUME VI: AIR (AP)

*All Limited Scope DMR's have been removed from the Table of Contents to more accurately reflect the contents of your manual. Work can still be performed to these DMR's if they have not expired. If you have any questions, call Technical Publications at 966-8622.

Rocky Flats Environmental Technology Site

4-L02-ER-OPS-GT.20

REVISION 3

SOIL INTERSTITIAL WATER SAMPLING

APPROVED BY: E Mosh For / S.G. Stiger / 9/30/94

Director, Print Name Date
EG&G Environmental Restoration Management

/ R S LUKER / 9.30.94

Quality Assurance Manager, Print Name Date
Data Management and Reporting Services

DOE RFFO/ER Concurrence on-File: ☑ Yes ☐ No ☐ NA

Environmental Protection Agency Approval Received: ☐ Yes ☐ No ☑ NA

Responsible Organization: Environmental Restoration Program Division Effective Date: 4/7/95

CONCURRENCE BY THE FOLLOWING DISCIPLINES WILL BE DOCUMENTED IN THE PROCEDURE HISTORY FILE:

Data Management & Reporting Services
Environmental Operations Management
OU2 Closure

USE CATEGORY 3

ORC review not required

The following have been incorporated in this revision:
94-DMR-000955

This procedure supersedes procedure 5-21000-OPS-GT.20, Revision 2.

Periodic review frequency: 3 years from the effective date

LIST OF EFFECTIVE PAGES

Pages	Effective Date	Change Number
1-11	~~1/94~~ 04/07/95	94-DMR-00955

TOTAL NUMBER OF PAGES: 11

TABLE OF CONTENTS

1. PURPOSE

This procedure provides instructions for collecting and field testing the soil interstitial water samples at the Rocky Flats Environmental Technology Site.

2. SCOPE

This procedure applies to Rocky Flats employees and subcontractors who are trained geotechnical personnel and can perform the requirements of Sample Manager or Field Technician.

This procedure addresses the following topics:

- Collecting soil interstitial water from zero-tension samplers
- Field-testing water samples
- Collecting soil interstitial water from tension samplers
- Preparing Radiological (RAD) Screens
- Collecting Quality Assurance samples from zero-tension samplers
- Decontaminating equipment

The following sections have been omitted from this revision because the equipment is installed in accordance with varying research and development requirements:

- Installation of Tension Soil Solution Samplers
- Installation of Zero-Tension Samplers
- Operation of a Rain Simulator
- Installation of Data Acquisitions and Telemetry Equipment

This revision is a total rewrite and revision bars are omitted.

This revision supersedes 5-21000-OPS-GT.20, Revision 2.

3. RESPONSIBILITIES

3.1 Field Technician

Collects, tests, and labels soil interstitial water samples.

Identifies and informs the Sample Manager of problems with the field work.

3.2 Sample Manager

Ensures that personnel assigned responsibilities in this procedure are properly trained and qualified.

Identifies, schedules, and coordinates the soil interstitial water sampling field activities.

3. RESPONSIBILITIES (continued)

3.2 Sample Manager (continued)

Ensures that all activities at the sampling site are performed in accordance with the appropriate project Health & Safety Plan.

4. PREREQUISITES

Sample Manager

[1] Ensure that all personnel performing this procedure are trained with the appropriate amount of field experience or on-the-job training under the supervision of a qualified geotechnical person.

[2] Document personnel qualifications related to this procedure in the project files.

[3] Inform the Field Technician when to collect samples from the tension or zero-tension samplers.

NOTE *Special field conditions are noted in the field log book.*

[4] Inform the Field Technician of special field sampling conditions, and document in the field log book, as necessary:

Field Technician

[5] Ensure that the following equipment is available in the field:

- Sampling bottles
- pH Meter
- Thermometer
- Conductivity meter
- Total alkalinity reagent
- 4,7,10 pH buffer solutions
- Conductivity calibration standard
- Decontamination buckets and brushes
- Phosphate-free, lab-grade detergent (such as Liquinox)
- Distilled water
- Turbidity meter
- Graduated cylinders and vials
- Chain of Custody labels

5. INSTRUCTIONS

5.1 Collecting Soil Interstitial Water from Zero-tension Samplers

Field Technician

[1] Connect the vacuum cap to the sampling bottle.

[2] Apply a vacuum for a minimum of 20 sec or until all of the water has been evacuated and water flow has ceased for at least 5 seconds.

[3] Rinse the vacuum cap with distilled water between each sample of the same horizon.

NOTE *Appendix 1, OU Surficial Soil Program Field Sampling Sheet, illustrates an example of the log sheet for recording data.*

[4] Record in Appendix 1, the time (military) the sample was taken, sample number, and the location number.

[5] Connect a new vacuum cap for each horizon.

[6] Transfer the water to a graduated cylinder or other measuring device.

[7] Measure the water volume to the nearest 5-ml increment.

[8] Record the water volume in Appendix 1, OU Surficial Soil Program Field Sampling Sheet.

5.2 Field Testing Water Samples

Field Technician

[1] Record a brief description of the water sample appearance in Appendix 1 in the Visual Description column.

The description should include at a minimum: color, shade, clarity, sediment content, and biota.

[2] **IF** the sample volume is less than 100 ml for the sample points on the same horizon, **THEN** composite the samples to make approximately 100 ml or greater.

5.2 Field Testing Water Samples (continued)

Field Technician (continued)

NOTE *A parameter may be omitted if the collected water sample volume is not sufficient to cover the pH and/or conductivity probe.*

[3] Measure as many of the following field parameters as possible, in the given order for the amount of water recovered, in accordance with 5-21000-OPS-GW.05, Field Measurement of Groundwater Field Parameters:

A. Conductivity
B. Temperature
C. pH
D. Total alkalinity
E. Turbidity

[4] Record the field parameters in Appendix 1.

[5] **IF** the composited sample volume is less than 100 ml,
THEN:

[A] Record the volume in Appendix 1.

[B] Measure all possible parameters described in Step [4], and record in Appendix 1.

[C] Discard the sample with the decontamination water.

[6] Composite the total alkalinity test water with the original sample.

[7] Verify that the sediment is transferred from the sampling bottle and measurement devices (such as graduated cylinder or vials) into the sample container.

[8] Place a Chain of Custody label over the lid of the sample container.

[9] Submit to the designated laboratory in accordance with 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples.

5.3 <u>Collecting Soil Interstitial Water from Tension Samplers</u>

NOTE *The frequency of soil interstitial water sampling from tension samplers is estimated daily by the use of remote control data logging system.*

Field Technician

[1] Check the tension sample bottles for evidence of water volume.

5.3 Collecting Soil Interstitial Water from Tension Samplers (continued)

Field Technician (continued)

NOTE *The vacuum pumps run automatically for tension samplers.*

[2] Disconnect the sample bottle from the pump and transfer the sample water to a graduated cylinder or other measuring device.

[3] Rinse the sample bottle with distilled water and reconnect the bottle to the pump.

[4] Record in Appendix 1, the time (military) the sample was taken, sample number, and the location number.

[5] Measure the sample water volume to the nearest 5-ml increment.

[6] Record the sample volume in Appendix 1.

[7] Field test the sample as described in Section 5.2, Field Testing Water Samples.

[8] **IF** the water volume is less than 100 ml,
THEN:

[A] Field test all possible parameters and record in Appendix 1.

[B] Discard the sample with the decontamination water into the satellite container.

[9] Do **NOT** composite the water samples.

5.4 Preparing RAD Screens

NOTE *The minimum volume sample is preferably 100-ml RAD screen sample. However, various laboratories may allow as low as 40 ml.*

Field Technician

[1] Separate a 100-ml portion from each sample, and reserve for a RAD screen.

[2] **IF** the entire sample volume is between 100- to 180-ml,
THEN:

[A] Submit the entire sample as a RAD screen.

[B] Notify the laboratory that the RAD screen is also the entire sample.

5.4 Preparing RAD Screens (continued)

Field Technician (continued)

[3] Do **NOT** combine samples that are collected from different horizons.

[4] Do **NOT** submit RAD screens less than 40-ml.

[5] Label each RAD screen sample, and submit to the designated laboratory in accordance with 5-21000-OPS-FO.13.

5.5 Collecting Quality Assurance Samples from Zero-tension Samplers

5.5.1 Rinsate Samples

Field Technician

[1] Collect one rinsate sample for every ten routine samples.

[2] Fill the sampling bottle with distilled water.

[3] Transfer the distilled water to a sample container and a RAD screen bottle.

[4] Label and ship the rinsate sample and the RAD screen in accordance with 5-21000-OPS-FO.13.

5.5.2 Duplicate Samples

NOTE *The number of duplicate samples is determined by recovery rates.*

Field Technician

[1] Collect one duplicate sample for every ten routine samples.

[2] **IF** there is sufficient sample volume of approximately 500 ml,
THEN:

[A] Split the collected water sample into two equal portions.

[B] Separate a 100-ml portion from each portion, and reserve for a RAD screen.

[C] Label each sample portion and RAD screen with a unique identification number.

[3] Label and submit the duplicate sample to the designated laboratory in accordance with 5-21000-OPS-FO.13.

5.6 Decontaminating Equipment

Field Technician

[1] Decontaminate all sampling equipment that comes in contact with the collected water samples in accordance with 5-21000-OPS-FO.03, General Equipment Decontamination.

[2] Deliver the samples to the Health and Safety Specialist/Site Safety Officer (HSS/SSO) for field radiological measurement of the containers.

6. RECORDS

Management of all records is consistent with 1-77000-RM-001, Records Management Guidance for Record Sources.

Field Technician

[1] Ensure that all field data is recorded, and document on Appendix 1.

[2] Submit the Appendix 1 data to the Field Data Manager for entry into the Rocky Flats Environmental Data System (RFEDS) in accordance with 4-B29-ER-OPS-FO.14, Field Data Management.

[3] Ensure that the original and one copy of Appendix 1 is transmitted to the ERPD Project File Center in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Submission of Appendix 1 to the ERPD Project File Center will satisfy Administrative Record requirements as defined in 3-21000-ADM-17.02, Administrative Record Screening and Processing.

There are no nonquality records generated by this procedure.

7. REFERENCES

1-77000-RM-001, Records Management Guidance for Records Sources

2-G18-ER-ADM-17.01, Records Capture and Transmittal

3-21000-ADM-17.02, Administrative Record Screening and Processing

5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples

5-21000-OPS-FO.03, General Equipment Decontamination

4-B29-ER-OPS-FO.14, Field Data Management

5-21000-OPS-GW.05, Field Measurement of Groundwater Field Parameters

APPENDIX 1
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OU SURFICIAL SOIL PROGRAM FIELD SAMPLING SHEET

OU2 SURFICIAL SOIL PROGRAM
FIELD SAMPLING SHEET

Date: _____ (Month/Day/&Year)

LOCATION	SAMPLE NUMBER	TIME	WATER VOLUME (ml)	TEMPERATURE (DEG. C)	pH	CONDUCTIVITY (ms/cm)	TOTAL ALKALINITY	TURBIDITY NTU	VISUAL DESCRIPTION	NUMBER OF BOTTLES

SAMPLE

Completed By: _____ (Print Name) _____ (Signature) _____ (Date)

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